

Comparisons of Job Characteristics

Focus Occupation: [Mechanical Engineers \(17-2141\)](#)

Associated Occupation: [Civil Engineers \(17-2051\)](#)

[Compare Knowledge](#)

[Compare Skills](#)

[Compare Abilities](#)

[Compare Detailed Work Activities](#)

[Compare Tools and Technologies](#)

<<	Focus occupation element is much lower
<	Focus occupation element is lower
0	Focus occupation element is at a similar level
>	Focus occupation element is at a higher level
>>	Focus occupation element is at a much higher level

Knowledge

Similarity of Focus Occupation to Associated Occupation: 72

Focus Occupation: Mechanical Engineers (17-2141)

Associated Occupation: Civil Engineers (17-2051)

Associated Occupation's Key Knowledge Elements	Average Rating, All Occupations	Associated Occupation's Rating	Focus Occupation's Rating		Evaluation of Focus Occupation
Engineering and Technology	5.7	24.5	21.5	<<	Extensive education and/or training may be required
Design	5.2	23.4	21.0	<	Expanded education and/or training may be required
Building and Construction	4.0	21.6	6.4	<<	Extensive education and/or training may be required
Mathematics	9.2	20.0	18.1	<	Expanded education and/or training may be required
Physics	4.3	15.8	15.3	0	Current knowledge level may be sufficient
Transportation	4.6	13.9	5.2	<<	Extensive education and/or training may be required
Administration and Management	8.4	13.0	10.0	<<	Extensive education and/or training may be required
Public Safety and Security	6.9	12.6	7.5	<<	Extensive education and/or training may be required
Law and Government	5.9	11.3	4.6	<<	Extensive education and/or training may be required
Chemistry	4.8	10.8	7.1	<<	Extensive education and/or training may be required
Geography	3.9	9.7	2.6	<<	Extensive education and/or training may be required

The maximum possible rating is 25.

Source: Alaska Department of Labor and Workforce Development, Research and Analysis Section analysis of O*NET (Occupation Information Network) data.

Skills

Similarity of Focus Occupation to Associated Occupation: 84

Focus Occupation: Mechanical Engineers (17-2141)

Associated Occupation: Civil Engineers (17-2051)

Associated Occupation's Key Skills Elements	Average Rating, All Occupations	Associated Occupation's Rating	Focus Occupation's Rating	Evaluation of Focus Occupation	
Mathematics	6.2	15.7	15.3	0	Current skill level may be sufficient
Operations Analysis	5.0	14.6	13.0	<	A higher skill level may be required
Complex Problem Solving	9.1	14.5	14.8	0	Current skill level may be sufficient
Judgment and Decision Making	9.4	14.5	14.1	0	Current skill level may be sufficient
Science	4.5	11.9	13.6	>	Skill level is likely sufficient
Systems Analysis	6.5	11.7	11.7	0	Current skill level may be sufficient
Systems Evaluation	6.4	11.7	12.0	0	Current skill level may be sufficient
Management of Personnel Resources	6.9	11.2	8.9	<	A higher skill level may be required
Management of Material Resources	3.7	9.1	7.2	<	A higher skill level may be required
Management of Financial Resources	3.3	8.9	5.8	<<	Extensive development of skills in this area may be required

The maximum possible rating is 25.

Source: Alaska Department of Labor and Workforce Development, Research and Analysis Section analysis of O*NET (Occupation Information Network) data.

Abilities		Similarity of Focus Occupation to Associated Occupation: 98			
Focus Occupation: Mechanical Engineers (17-2141) Associated Occupation: Civil Engineers (17-2051)					
Associated Occupation's Key Abilities Elements	Average Rating, All Occupations	Associated Occupation's Rating	Focus Occupation's Rating	Evaluation of Focus Occupation	
Problem Sensitivity	11.1	15.4	13.6	<	Some improvement in abilities may be required
Deductive Reasoning	10.6	15.2	15.8	0	Current ability level may be sufficient
Mathematical Reasoning	6.3	14.9	15.7	0	Current ability level may be sufficient
Inductive Reasoning	10.2	14.4	12.8	<	Some improvement in abilities may be required
Visualization	7.5	14.1	12.7	<	Some improvement in abilities may be required
Number Facility	6.3	13.9	13.0	0	Current ability level may be sufficient
Information Ordering	9.9	13.8	15.4	>	Current ability level is likely sufficient
Category Flexibility	9.0	13.4	12.7	0	Current ability level may be sufficient
Flexibility of Closure	7.8	13.3	10.3	<<	Extensive improvement in abilities may be required
Perceptual Speed	7.4	11.8	10.6	<	Some improvement in abilities may be required
Speed of Closure	5.9	9.9	8.7	<	Some improvement in abilities may be required

The maximum possible rating is 25.

Source: Alaska Department of Labor and Workforce Development, Research and Analysis Section analysis of O*NET (Occupation Information Network) data.

Activities that Both Occupations Have in Common

Similarity of Focus
Occupation to Associated
Occupation: 90

Focus Occupation: Mechanical Engineers (17-2141)
Associated Occupation: Civil Engineers (17-2051)

Work Activities	Exclusivity of Activity
Advise clients or customers	19
Advise clients regarding engineering problems	67
Analyze engineering design problems	69
Analyze engineering test data	71
Analyze project proposal to determine feasibility, cost, or time	69
Analyze scientific research data or investigative findings	27
Analyze technical data, designs, or preliminary specifications	47
Analyze test data	64
Bid engineering, construction or extraction projects	80
Calculate engineering specifications	64
Collect scientific or technical data	30
Communicate technical information	4
Compile numerical or statistical data	38
Compute production, construction, or installation specifications	58
Confer with engineering, technical or manufacturing personnel	25
Coordinate engineering project activities	71
Create mathematical or statistical diagrams or charts	43
Delegate authority for engineering activities	73
Determine specifications	67
Develop or maintain databases	30
Develop plans for programs or projects	31
Develop policies, procedures, methods, or standards	21
Develop tables depicting data	33
Direct and coordinate activities of workers or staff	3
Direct personnel in support of engineering activities	74
Draw prototypes, plans, or maps to scale	57
Estimate cost for engineering projects	69
Estimate time needed for project	64
Evaluate costs of engineering projects	70
Evaluate engineering data	60
Examine engineering documents for completeness or accuracy	62
Explain complex mathematical information	30
Inspect facilities or equipment for regulatory compliance	51
Lead teams in engineering projects	73
Plan testing of engineering methods	72
Prepare reports	8
Prepare technical reports or related documentation	22
Provide analytical assessment of engineering data	75
Read blueprints	10

Read technical drawings	7
Resolve engineering or science problems	46
Test equipment as part of engineering projects or processes	67
Understand engineering data or reports	48
Use computer aided drafting or design software for design, drafting, modeling, or other engineering tasks	58
Use computers to enter, access or retrieve data	3
Use drafting or mechanical drawing techniques	50
Use government regulations	44
Use intuitive judgment for engineering analyses	72
Use knowledge of investigation techniques	16
Use mathematical or statistical methods to identify or analyze problems	30
Use pollution control techniques	62
Use project management techniques	47
Use quantitative research methods	35
Use relational database software	26
Use scientific research methodology	21
Use spreadsheet software	18
Use technical regulations for engineering problems	61
Use word processing or desktop publishing software	17
Work as a team member	36
Write business project or bid proposals	48

Not all positions in these occupations will necessarily perform all of the listed activities. The exclusivity rating is an indication of how unique the activity is amongst all occupations. The maximum rating is 100. High scores indicate that only a small number of occupations engage in that activity.

Source: Alaska Department of Labor and Workforce Development, Research and Analysis Section analysis of O*NET (Occupation Information Network) data.

Tools and Technologies that Both Occupations Have in Common

Similarity of Focus
Occupation to Associated
Occupation: 73

Focus Occupation: Mechanical Engineers (17-2141)
Associated Occupation: Civil Engineers (17-2051)

Tools and Technologies	Exclusivity
Business function specific software	1
Cameras	2
Computer printers	2
Computers	1
Content authoring and editing software	1
Data management and query software	1
Development software	4
Indicating and recording instruments	2
Industry specific software	1
Length and thickness and distance measuring instruments	2

Not all positions in these occupations will necessarily use all of the listed tools and technologies. The exclusivity rating is an indication of how unique the tool or technology is amongst all occupations. The maximum rating is 100. High scores indicate that only a small number of occupations use that tool or technology.

Source: Alaska Department of Labor and Workforce Development, Research and Analysis Section analysis of O*NET (Occupation Information Network) data.